Observership, 'knowing' and semiosis

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Abstract

This article asks how future semiotic research, particularly with a biosemiotic orientation, will incorporate a theory of observership. The article take its cue from Sebeok's (1986, 1991a, 1991b) comments on John Archibald Wheeler's conception of the 'participatory universe' and attempts to explicate the relevance of Wheeler's (1994, 1998) philosophy of science for semiotics. The article argues that the quantum view of observership aligns with that of semiotics in that both envisage observation as a *field* of modification. The article seeks to contribute to recent key debates in the field on 'knowing' sciences on relation and cybersemiotics It develops some of the themes foreshadowed towards the end of an earlier article outlining a future orientated observership in contrast to a *vis a tergo* perspective.

Bohr Not to criticise, Margrethe, but you have a tendency to make everything personal.

Margrethe Because everything is personal! You've just read us all a lecture about it!

Michael Frayn, *Copenhagen* (1998)

Introduction

Observership is, explicitly, the key concept in the distinction between first- and second-order cybernetics (Glanville 2003). In semiotics, by contrast, it has been omnipresent but under-theorised. Unsurprisingly, one of the planks of cybersemiotics (e.g. Brier 1996, 2008), a melding of second-order perspectives with a semiotic frame, has been the project of re-emphasizing the observer. The key task in such an enterprise is not so much accounting for 'observer bias' in the apprehension of 'reality' – that is, acknowledging 'faults' in an unstable observer's grasp of a supposedly stable phenomenon – but, rather, the recognition that 'reality' is inherently unstable because it cannot exist as a settled phenomenon divorced from observership. More pointedly, in any reality there is semiosis: that is, relations between (semiosic) objects, including observers, will involve such processes as anticipation or 'intention' which are themselves not detectable otherwise than by a semiosic system. Cybersemiotics mission is to

account for such semiosis. Put briefly, it is "an attempt to conduct a constructive philosophy of science addressing an interdisciplinary scientific problem on the border of philosophy and science" (Brier 2008: 149) with the aim of understanding the role of the embodied mind in cognition and communication (Brier 2008: 4). In contrast to the guiding ideas of information processing and rationality, as well as the object-based view of science in which a honed method accounts for stable and definable physical phenomena, cybersemiotics addresses life not just in its physical occurrence within material, energetic, and informational systems, but life as it subsists through qualia, consciousness and the inner world of first person experiences (Brier 2008: 363). It is cybersemiotics that has most consistently pursued the implicit problem of observership in semiosis, proceeding from the understanding that the constituents of human knowing do not consist solely of the coupling of a material observation instrument and a physical object of observation. Rather, the 'knowing' of all species in a cybersemiotic frame involves a dynamic interaction of observed and observer.

A concern with the domain of observer-observed interaction has thus been central to semiotics and second-order cybernetics, only relatively lately having been articulated in cybersemiotics. Yet the provenance of this concern is to be found in the quantum revolution in physics. In a well-known quote, Einstein outlined the consequences of the quantum perspective for physics:

> Physics is an attempt conceptually to grasp reality as it is thought independently of its being observed. In this sense one speaks of 'physical reality'. In pre-quantum physics there was no doubt as to how this was to be understood. In Newton's theory reality was determined by a material point in space and time; in Maxwell's theory, by the field in space and time. In quantum mechanics it is not so easily seen. If one asks: does a ψ-function of the quantum theory represent a real factual situation in the same sense in which this is the case of a material system of points or of an electromagnetic field, one hesitates to reply with a simple 'yes' or 'no'; why? What the ψ-function (at a definite) time asserts, is this: What is the probability for finding a definite physical magnitude q (or p) in a definitely given interval, if I measure it at time t? The probability is here to be viewed as an empirically determinable, therefore certainly as a 'real' quantity which I may determine if I create the same ψ-function very often and perform a q measurement each time. But what about the single measured value of q? Did the respective individual system have this q-value even before this measurement? To this question there is no definite answer within the framework of the theory, since the measurement is a process which implies a finite disturbance of the system from the outside; it would therefore be thinkable that the system obtains a definite numerical value for q (or p) the measured numerical value, only through the measurement itself.
>
> (Einstein (1949: 94)

Hopefully, this comment of Einstein's is self-explanatory. It demonstrates that the act of 'knowing' is not simply a matter of neutrality whereby one entity assimilates the details of another through stable, untrammelled, unidirectional

information processing. Far from it. Instead, the seemingly disinterested act of measurement is found to *affect* the 'nature of reality'.

Affecting the 'nature of reality'

The idea that measurement itself has impact on what is being measured is not a difficult one to grasp. For example, it is increasingly reported that the growing popularity of whale watching has had an effect on the natural behaviour of whales, no matter how discreet or environmentally sound in planning the activity is (Lusseau: 2014). In baking, to take another example, measuring precisely with a cook's thermometer the temperature in an oven is likely to change the temperature as the oven door is opened to insert the thermometer. In fact, these examples are close to the common idea of observer bias or what Barrow and Tipler (1986: 2) call the "selection effect". In an earlier period of semiotics, the work of Charles Morris distinguished between the 'designative', 'appraisive' and 'prescriptive' properties of signs, seeing in the first the signification of *observable* properties "of the environment or of the actor" (1964: 4). More recently, (postmodern) ethnography has grappled with the observer-generated nature of its data (Clifford 1986, Marcus and Fischer 1986). Famously, Geertz called for a 'thick description' (Geertz 1993 [1973]) in anthropology, a semiotically inflected approach to fieldwork and cultural analysis in which the depth of interpretability of human artefacts and practices is given its due. As such, the 'thin' descriptions of those ethnographers who do not recognize the semiotic richness of their objects, or the effect on the objects of observing them, are failures to take into account the role of the observer or, more pointedly, they are ethnocentric. Similarly, in constructivism and second-order cybernetics (Maturana 1988, von Foerster 1984), Von Foerster (2003: ix) asks:

> How do I know the objects? Where are they? Of course, I can reconfirm or establish a rich connection with an object by touching or by smelling it or talking about it, and so I had the idea to make the object a representation of the activity or behavior of the observer, instead of the passive being looked or just sitting there.
>
> (von Foerster, 2003: ix)

In all of these, the relationship of causality in the observer-observed couplet is, to a great extent, played down in comparison to the cue that is offered by quantum physics. Barrow and Tipler (1986: 4) make a distinction between "those features of the Universe whose appearance depends on anthropocentric selection" and "those features which are genuinely determined by the action of physical laws". Yet, as Cariani (1998: 365), in Morrisian mode, suggests, any scientific modelling relies not on straightforward instrument-object observership but must comprise rule-governed syntactic operations on signs (the formal, mathematical part of the model), semantic relations between the signs and the physical world (the measurement part of the model) and pragmatic relations impinging on the signs (the evaluation of which enables the formulation of predictive goals, the ultimate

objective of scientific observership). The distinction between physical laws and human error may be less clear cut, then, than Barrow and Tipler allow.

Nevertheless, "anthropocentric selection" is associated with what is often understood as a *weak version* of the Anthropic Principle originating in the works of Carter (1974) and Dicke (1961), developed also by Wheeler (1994). Conversely, Carter (1974) also posited a *strong version* of the principle in which the reason for the universe developing in the way that it did was precisely to *allow* observership. A similar distinction obtains between the 'quantum reality' that is the focus of Heisenberg's uncertainty principle (1949) and the more general 'observer effect' where objects are directly observed. The former can only properly be explicated with reference to complex and precise calculations of mass and velocity, as the strong Anthropic Principle is built on similar calculations regarding the expansion of the universe. Upon these calculations rest a number of debates about the possible conclusion that there is a God-like designer, there are many universes, or both - as in the work of the Canadian philosopher, John Leslie (1983, 1988, 1992, 1996) who was much exercised by the possibility that "living beings could see only universes whose characteristics were life-permitting" (1988: 269). Unfortunately, the technical expertise required to address the detail of quantum observership in the current article is lacking. However, in considering observership in semiotics, particularly as it is inflected in the 'knowing' science exemplified by biosemiotics and demanded by cybersmiotics, it is clear that there is a broad affinity between the strong Anthropic Principle, quantum reality and the semiotic observer. This affinity lies in the observer-observed relationship taking place in a *field* that is modified by the observation.

The field of semiosis: signs, observership and modification

In some ways, the act of modification in semiotics seems counter-intuitive or somehow not characteristic of how signs have traditionally been considered to function. When a sign is seen to *stand* for something – *aliquid stat pro aliquo* – and an analyst can elucidate that 'standing for' in the manner of the semantic aspect of Cariani's (1998) description of modelling, there is an act of uncovering in which the analyst maintains a position of vaunted neutrality. Yet, when an analyst is dealing with a concept of sign in which there is a more complicated set of factors than a one-to-one link – for example, what the sign is for, what it becomes, what its potential of transformation is, what it is for the analyst at the moment of encounter, what its relation to other signs is, what it contributes to the modelling of the world by the species using it, what resonance it has for the specific sign user – then the claim of neutrality is placed in crisis (the pragmatic element of modelling as identified by Cariani). The one-to-one link involves, of course, two elements; when a third element enters into the relation – as it always must with signs – there is another scenario. Such a formulation of the sign arises, historically, most clearly from Poinsot, whose subsequent influence on Peirce has been amply demonstrated in the work of John Deely (see Cobley 2009). The formulation insists that it is the *entire relation* of elements in a sign that constitute a sign rather than just the representational or semantic "relation" between some

vehicle and some terminus as has been traditionally assumed in the tradition which has followed Bréal (1900), Ogden and Richards (1923) and the semiological tradition. A simpler way to put this is to state that the sign is a thoroughly contextual phenomenon – not just in the sense that it relates to a situation; rather, it negotiates between mind-independent being (known as *ens reale* by the Latins) and mind-dependent being (*ens rationis*) (Deely 2001: 729). It should also be remembered that relation amounts not just to the referentiality of the sign but also, quite obviously, to the 'sign user' plus motivation and interest. It is motivation and interest which dictate the shape of mind-dependent being. Furthermore, there is not just motivation in the *use* of signs; in addition, there is motivation and interest, however these might be configured, in the discovery of 'further signs'. That is, there is motivation and interest in 'analysis' and in *research*. What this entails, of course, is the recognition that research is often ruled by the necessary constituent of observership. Put another way, any research, because it involves sign use, will oscillate between mind-independent being (with its motivation and interest arising from the specific experience of the user) and mind-independent being (with the consciousness that there is a world out there which is, nevertheless, filtered through motivation and interest).

Human semiosis is the *field* constituted by movements to and fro between the mind-dependent and the mind-dependent. Moreover, in being characterized by movements, that field changes with the observership or recognition of each semiosic act. Yet, typically, semiotic analysis of the world, both as research in itself and figured as part of supposedly broader research projects and methodologies beyond semiotics as a disciplinary field, has often been fixated on the possibly that artefacts and close readings of them, in one-to-one relations, will yield ineluctable answers. This is especially true of, among others, (post)Saussurean analysis and its structural investigations of *langue*/*parole* or paradigms/syntagms; Barthesian myth criticism - exposing the construction of *paroles* from *langue* (exposing ideology) – which was publicly abandoned by Barthes in 1971 (a fact overlooked by his most slavish followers - see Barthes 1977); and Lévi-Strauss' avowedly reductionist anthropology (1977, 1987) which unified the 'primitive' and the civilized with reference to a near-universal 'structure of the mind'. One problem is that such analysis evinced the tendency to break up artefacts, to focus on the sign rather than semiosis. Indeed, this is not uncharacteristic of some of the ways in which the work of Peirce has been used (most famously by Jakobson 1965), placing emphasis on a few of the signs in the Decalogue rather than on the action of semiosis as a field. Poststructuralism (espoused by "the postmodernists so-called" – Deely 2003) went to tortuous and unnecessary lengths to demonstrate that semiologically-orientated semiotics made the fatal mistake of focusing on the sign in a static union with an object, promoting particularly the fallacy of 'representation'. Yet, poststructuralism itself proceeded to erroneously concentrate on the sign vehicle as simultaneously some kind of slippery, autonomous trickster and as an instrument and symbol of tyranny akin to the fasces. In each case, theoretical convenience dictated interest in seemingly isolatable entities rather than on the more troublesome and messy implications of *relation* in the sign. Observership, in the shadow of the synchronic turn to the sign-object relationship, might therefore have been assumed to have

been de-emphasized in sign study. Along with this, the sense of semiosis as a modifiable field was lost. Uncovering the nature of semiotics' conceptualising of the observer, a conceptualising that is made possible especially with the emergence of biosemiotics and with the guidance of cybersemiotics, is the main purpose of this paper.

Peirce, Sebeok and Wheeler's observership

Despite early forays by Morris, observership in semiotics – certainly in the second-order sense under discussion here – was first seriously posited as an issue for sign study by Thomas A. Sebeok. In addition to organising a special session dedicated to observership at the Semiotic Society of America meeting in 1982, of which contributions by von Uexküll (1983) and Williams (1983) are extant, Sebeok sought to incorporate the cosmological perspectives of John A. Wheeler into semiotics (Sebeok 1991a, 1991b). Not only did Sebeok see in Wheeler's work the 'Jourdain effect', in which Wheeler's thinking was always 'semiotic' in orientation without knowing it, Sebeok also recognized Wheeler's *oeuvre* as cognate with Peirce's cosmology and, in particular, Peirce's (CP 5.316) future-orientated community of 'knowing'. Sebeok writes (1991c: 48) that "At the heart of Wheeler's 'meaning-circuit model' of existence lies the postulation that semiosis" rests on the "community of observer-participants". He adds (1991b: 84)

> In this model, meaning before the advent of life must, of course, be founded on construction: 'Only by [life's] agency is it even possible to construct the universe of existence or what we call reality' (1986:314). In sum, in Wheeler's grand conception, physics is the offspring of semiosis, 'even as meaning is the child of physics'.

Ultimately, Sebeok sees the strong version of the Anthropic Principle as consonant with semiotics, particularly "Wheeler's suggestion that the fundamental physical constants, the nuclear and cosmological parameters, and others, are constrained by the unbudging requirement that life evolve, and that these constants are altered by our consciousness of them". Put briefly, "life modifies the universe to meet its needs, and accomplishes this by means of sign action" (Sebeok 1991c: 135). During the observership session of the SSA in 1982, Sebeok mentioned to Brooke Deely that "Every time you look at the sun you affect its rays to an infinitesimal degree" (Williams 2017). Within these general statements, Sebeok aligns himself with a Wheelerian view of observership that will be unpacked in the paragraphs that follow and which, it will be argued here, is consonant with the idea of semiosis as a field of observership where modification is inherent.

In addition to its complexity, Wheelerian observership demands to be unpacked because Sebeok's cue to consider physics as meaning in which an observer is implicated, an act of co-participatory creation, has not really been acknowledged (a noble exception being Merrell 2011 who demonstrates the influence on Sebeok of twentieth-century physics, especially Wheeler). Nor has it been developed. This is not surprising since Wheeler's voluminous writings on physics are

formidable for non-specialist and specialist alike, despite the fact that they bear the substance of his notions of the participant-observer and the participatory universe. However, the publication in the 1990s of Wheeler's 1953-1991 writings on philosophy of science (Wheeler 1994), as well as his autobiography (Wheeler with Ford 1998), offers some succour to those who would take Sebeok's cue to understanding the semiotic endeavour. Reasoning at the quantum level, but in a manner susceptible of translation to other levels, it becomes increasingly apparent why Wheeler's perspective on observership is congenial to semiotics and pragmaticism. Chiefly, Wheeler is concerned with physics not just as mathematically 'objective' but as 'meaning' or 'significance'. His formulation regarding observership effectively hinges on two points regarding the relative positions of observers. The first, requiring only the most rudimentary understanding of relativity, is that "The observer is elevated from 'observer' to 'participator' . . . The position (or momentum) of an object only acquires a useful meaning through the participatory act of observation" (1994: 25). In short, relativity entails that the observer is 'active' in enacting that relativity. Second comes the question "Is the architecture of existence such that only through 'observership' does the universe have a way to come into being?" (1994: 26). It should be clear that these statements constitute neither relativism (cognitive or cultural) nor constructivism. Certainly, they differ from the constructivist position despite their apparent alignment with this position at first sight. Maturana arguably the leading bioconstructivist and one of the figures debated in cybersemiotics, contends that

> cognition has no content and does not exist outside the effective actions that constitute it. This is why nothing exists outside the distinctions of the observer. That the physical domain of existence should be our limiting cognitive domain does not alter this. Nature, the world, society, science, religion, the physical space, atoms, molecules, trees..., indeed all things, are cognitive entities, explanations of the praxis or happening of living of the observer, and as such, as this very explanation, they only exist as a bubble of human actions floating on nothing. Everything is cognitive, and the bubble of human cognition changes in the continuous happening of the human recursive involvement in co-ontogenic and co-phylogenic drifts within the domains of existence that he or she brings forth in the praxis of living.
>
> (Maturana , 1988: 40)

The difference between Wheeler's and Maturana's positions should now appear stark. The latter's rhetoric works to deny the existence of distinctions outside of the observer – everything is cognitive. By contrast, Wheeler is unconcerned with cognition and consciousness. Instead, he suggests that

> the universe is a 'self-excited circuit' – a system whose existence and whose history are determined by measurements. By 'measurement' I do not mean an observation carried out by a human or human-designed instrument – or by an extraterrestrial intelligence, or even by an ant or an amoeba. Life is not a necessary part of this equation. A measurement, in this context, is an irreversible act in which uncertainty collapses to certainty. It is the link between the quantum and classical worlds, the point where what *might* happen – multiple paths, interference patterns,

> spreading clouds of probability – is replaced by what *does* happen: some event in the classical world, whether the click of a counter, the activation of an optic nerve in someone's eye, or just the coalescence of a glob of matter triggered by a quantum event.
>
> (Wheeler with Ford, 1998: 337)

Moreover, he states that "the essential feature of an act of 'measurement' is amplification from the quantum thing observed to the classical thing doing the observing, which need have nothing to do with human intervention or human consciousness" (ibid.: 343). Within this is a simple point which bears repeating: that observership does not always entail humans and does not exclusively involve living beings.

What matters to Wheeler is not so much the anthropocentrism of observation so much as the scale involved and the measuring device in observation. This is summed up in the Sebeokian title of his famous essay: 'Not consciousness but the distinction between the probe and the probed as central to the elemental quantum act of observation'. He adds (ibid.: 330),

> No matter what the uncertainties of the small-scale world, no matter how chaotic the fluctuations, our knowledge of nature rests ultimately on perfectly definite, unambiguous observations – what we see directly or what our measuring apparatus tells us. How can this be? If the world 'out there' is writhing like a barrel of eels, why do we detect a barrel of concrete when we look? To put the question differently, where is the boundary between the random uncertainty of the quantum world, where particles spring into and out of existence, and the orderly certainty of the classical world, where we live, see and measure?

The differences in what "we detect" are a matter of modelling. Human modelling is often summed up as 'language', but the critical point is that the human *Umwelt* consists of the full potential of verbal and nonverbal semiosis accruing to the species (Sebeok 1988). Human measuring devices, the non-human 'observers', should therefore be considered as the 'extensions' of modelling – efficient in their variety and precision for many purposes, but faulty and sometimes insufficiently accurate when compared to the modelling of other species, terrestrial and extra-terrestrial (if such exists). Wheeler's questions currently consume contemporary semiotics – not in respect of his considerations of the cosmos but, more locally, in semiotics' investigations into terrestrial nature. However, they still concern the point at which "The observer is elevated from 'observer' to 'participator'" (Wheeler: 1977: 6). Put simply, the question is: what are the consequences of the different apprehensions of phenomena by humans, non-human animals and plants?

Yet, before commenting on this matter, it should be mentioned that there is another reason why Wheeler's philosophy of science chimes with contemporary semiotics. This lies in his commitment to pragmaticist realism, a commitment that extends even to the act of observing; he writes:

> So then what is 'observership'? It is too early to answer. Then why the word? The main point here is to have a word that is not defined and never will be defined until that day when one sees much more clearly than one does now . . . how the observations of all participators, past, present and future, join together to define what we call 'reality'.
>
> (Wheeler ,1994: 43)

With his reference to the 'community of observers' or 'community of participators' here, it is not surprising that Wheeler cites favourably (1994: 307) his philosophical forebears, Peirce, Wright and Royce. However, Wheeler's faith in the path of enquiry, the route to a final interpretant, is demonstrated not just in his insistence on the accumulation of observations but also in his comment on the 'tree that fell in the forest', the unobserved event beyond specific cognition and consciousness. Wheeler insists that such an event leaves "a fallout of physical evidence so near at hand and so rich that a team of up-to-date investigators can establish what happened beyond all doubt" (1994: 305).

For Wheeler, then, there is no such thing as an 'impossibility' of knowing as a consequence of, for humans, consciousness and species-specific cognition. Rather, the very fact that the origin of the universe is not subject to a private judgment means that public judgment (science) - 'one world' out of many observer-participants (1994: 295) - is directly required even in determining origins:

> One does not need to know Maxwell thermodynamics to perceive a thunderbolt; and one does not have to trace out the unbelievably many ties of 'observership' with the deepest questions of knowledge, meaning and quantum theory to accept willingly or unwillingly – but accept – the strange sense in which observation now participates in defining the reality of the past: direct involvement of observership in genesis
>
> (Wheeler 1994: 43).

As Sebeok (1991b: 84) states, the various connecting phases of history in physics amount to a demand for meaning, thus "meaning before the advent of life must, of course, be founded on construction". These are, without doubt, far-reaching pronouncements and demonstrably consonant with semiotic – especially Peircean – perspectives on the practice of science and the process of knowing (see, for example, Brier 2017).

Observership and cognition

Yet, there are obvious limitations to Wheeler's perspective in the building of a worldview or philosophy of science, certainly of the sort envisaged by cybersemiotics. As Brier (2017) points out, the participatory perspective adumbrated by Wheeler is radically undermined by the fact that the (public) observation experiments that he projects are carried out within the frame of the

traditional instrument-object relations that characterize much scientific research. Wheeler's participatory universe, Brier points out, rests on an objective information-theoretical concept based on the 'bit' or what Bateson would call "a difference that makes a difference" (Brier 2017). Thus, the participatory universe perspective has more in common with an information processing paradigm than with more qualitative, first-person accounts of cognition and observation.

It needs to be made clear, therefore, that the vicissitudes of cognition – the qualia and feelings that perfuse 'knowing' – do not 'get in the way' of observership in the manner of 'bias' and suchlike. More aptly, first-person accounts will assert that cognition is part and parcel of observership. Of course, that is easier said than done. In the play, *Copenhagen*, which provides the epigram for the current article and was much loved by Sebeok towards the end of his life, science is constantly presented in terms of the 'personal'. This is not to say that the drama revolves around the humanist chestnut of individual choice; rather, in its speculation about why Werner Heisenberg went to meet Niels Bohr in 1941 and what they said at their meeting, the play is concerned with the possibilities of interpretation in science as well as social life. Did the meeting take place for the purposes of rekindling a friendship, to play out aspects of an Oedipal scenario, to discuss physics, to contribute to a Nazi nuclear bomb, to avoid contributing to a Nazi bomb? These are among the questions that the play raises, along with a range of first-person, felt experiences that may be social, historical, political, psychological, existential, familial and so forth. The play reminds the audience that, from Einsteinian relativity onwards, what is to be understood as the universe is a result of measurement by the human. As a theatrical narrative, with all the possibilities it evokes in live performance, *Copenhagen* presents the human drama of the "difference that makes a difference" and the Wheelerian derivation of "It from bit". At present, arts such as drama are, perhaps, better placed to recast quasi-quantitative measurement with a qualitative overtone. While cybersemiotics points to modes of 'knowing' bound to first-person attributes and suggests a path to take with regard to augmenting Wheeler's information-shackled conception of observership, it is too early to predict just *how* it might be possible to conceive of a participatory universe that involves not only a reliance on measurement but also the observer's constitutive 'baggage' – feelings, emotions, individual physico-cognitive development, and so forth, as well as that observer's evolutionary continuity and co-habitation with other animals.

Bearing in mind these caveats, however, and being mindful not to let the baby be thrown out with the bathwater, the issue for consideration now is the extent to which Wheeler's statements clearly supervene on arguments at a quantum and cosmological level. In consonance with the trajectory of contemporary semiotics (including cybersemiotics) and its embrace of cognitive and affective issues, some very preliminary sketch marks of a first-person observership can also be presented. Yet these proceed from the observation that Sebeok seems to imply that Wheeler's formulation of the 'participatory universe' could be placed at the heart of the project of semiotic research – research, that is, into every spectacular and quotidian facet of culture and into the lowly, most basic aspects of nature. Notwithstanding the absence of accounting for the full range of cognition in

Wheeler's view, what would semiotic research with an awareness of participant-observership be like?

Marking observership in semiotic research

There are numerous examples of empirical research in semiotics, but Bouissac's (2010) book on circus performance contains some pronouncements on the status of observership which are apposite in respect of the argument in the current article. He describes (2010: 1) the build-up to one of his observations of performance:

> And here I am, more anxious than I should be, with a certain dose of elation and irrational excitement: I am going to the circus . . . In the taxi which rushes me through the rain to the hotel, I could wonder why someone who has seen a thousand and one circuses in his life keeps checking his watch to make sure that he will not miss the next show. But I do not waste time asking myself such a silly question. I am entirely focused on "going to the circus", aroused by the forthcoming experience as if it were a date with the unknown.

With such engagement – and anticipated engagement – in the spectacle, the act of observing described in this account is one where it is not difficult to imagine the mutual fecundity in the observer-observed relation. In performance, it is a commonplace that performers do not remain immune in their work from the mood of their spectators. The converse is true, too, making up what is commonly called 'atmosphere'. In his account, of course, Bouissac (20110: 2) notes that he can only ever produce what he calls a "verbal copy", failing to capture the essence of the act of observership, "the miracle of the body presence of the artists and the colors of my emotions". The blueprint for the text might be considered to be the most important piece of verbal evidence. Yet, whilst the "score" of the performance is absent, it is taken as "tacit" in the efficacious work between performers and observers. In the idea of the "tacit", there is clearly a suggestion that a *field* exists between the performance and its observation.

A coolly analytic observation would seem to deny the existence of an observer-observed field. This recalls Wheeler's (1977: 5) assertion that

> [I]t was long natural to regard the observer as in effect looking at and protected from contact with existence by a 10 cm slab of plate glass . . . In contrast, quantum mechanics teaches the direct opposite. It is impossible to observe even so minuscule an object as an electron without in effect smashing that slab and reaching in with the appropriate measuring equipment.

Watching a circus performance is not identical to observing an electron. Nevertheless, the rational observation, where observer and observed are separated by a (psychological) glass slab is, for Bouissac, no more sufficient than is an observation which is aware of its own constructedness in culture. For him, emotions and qualia are crucial aspects of the process

Acknowledging the observer-observed field, moving the act and focus of observation beyond the realm of the 'purely rational', might also have some bearing on the spectacle of non-human artefacts. Combining ethological expertise with a contextualization of circus performance, Bouissac (2010: 44) observes inter-species communication between tiger and human:

> [H]e started to scratch Domino's forehead while exchanging with her the signal of utmost trust in tiger communication that can only be transcribed as "pfrrr", a transliteration that falls short of all the nuances with which it is uttered: softness, warmth, intensity, even passion. This is the reassuring vocal contact between her tigress and her cubs who readily reciprocate in similar fashion. Later, in a tiger life, it becomes a standard sign of comfort and affection.

The question that arises from these reflections on observation in Bouissac's circus book, particularly this last quote, concern the difficulty of 'knowing' any object that harbours its own kind of 'knowing'. This is a key dilemma in semiotics and is also where Bouissac, and semiotics, depart from, as well as throw into relief, the scientistic aspect of Wheeler's observer. One-to-one observership of emotions, even among well-acquainted humans, is even more difficult than the call for 'thick description' suggests. Such observership of non-human species is at least equally challenging in research terms. And, of course, observership of inter-species emotions, as in this last example, proliferates problems for the 'detached' observer's rendering of the research objects. Let us consider an example involving observership and emotion before commenting on observership in relation to other species.

Observation, rationality and emotion

The disavowal of the posssiblity of accounting for motivation and purpose in the study of other species sometimes overlooks the fact that there is a difficulty of the same order in analysing the purpose of supposedly rational creatures when emotions cannot be placed within strict 'cultural' or 'behavioural' co-ordinates. Already, these concerns take this discussion far beyond the view of what constitutes observers for Wheeler. Furthermore, when anthropology called call for the aforementioned thick description (cf. Bouissac's "verbal copy") which would pay fine attention to the variegated character of the culture in which a specific object or practice was embedded – producing expectations that it might lead to an account of whether the object or practice was genuine, a parody, inconsequential, of great ritual importance, and so forth - uncertainty still remained. Even though one might glean some information on emotional states and feelings in the object or practice through a sense of any stated or pre-investigated importance of that particular object or practice, it is still easy for observers to miss the most telling details.

An example comes from a specific, related and well-known genre of observation: documentary. Les Blank's film, *Burden of Dreams* (1982), narrates the making of Werner Herzog's feature film *Fitzcarraldo* (1982) and includes an account of the famous anecdote in which the driven Herzog prevented his leading actor and

friend, Klaus Kinski, from abandoning the production. Although Kinski had announced that he was leaving the jungle where the film was being short, Herzog forced him at the point of a shotgun to continue with the film. More than a decade and a half later, Herzog made his own documentary, *My Best Fiend* (1999), which charted his intense friendship with Kinski and the latter's frequent and sustained outbursts of violence and incoherent screaming in behaviour commonly perceived to be psychotic. In the closing stages of the latter film, in which Kinski's putative madness is apparent, Herzog re-tells the *Fitzcarraldo* shotgun incident. This time, however, there is a twist: the uncontrollable rage of Kinski which was not so extensively highlighted in *Burden of Dreams* and which was documented so comprehensively in *My Best Fiend*, is the subject of a crisis of observership. The first film presents the anecdote as one demonstrating Herzog's unnatural drive, with Kinski as the put-upon victim of the jungle, the climate, the food and the director; the second film shows Kinski's history of unreasonable behaviour. Yet Herzog's telling of the shotgun incident involves a confession in which he reveals that the Peruvian natives who appeared in the film were certainly irked by the mad fury and rage of Kinski but, nevertheless, they were concerned to the point of fear at Herzog's serenity – the real madness generating tension amidst work on the film? – during Kinski's raving.

Observing emotions, then, is a hazardous venture. This is particularly the case when they have different manifestations and when they are culturally specific. Serenity and rage not only manifest themselves differently, they also have different significations for different cultures. In a way, this is an easy point. However, what happened in this case is that one observation (if a documentary film - *Burden of Dreams* - can be called that) featured a narrative within a particular context which was then recast in the context of a different observation – *My Best Fiend* – where the actions in the narrative were not only feasible, credible and understandable, but almost justifiable in the context (Kinski's apparent madness), yet undermined by a re-telling of the narrative which allows the judgment of some peripheral participants in the original narrative (the Peruvian natives) to be foregrounded, rendering aspects of the first telling of the narrative (Herzog's neurotic drive) to re-surface once more. The easy point quickly takes on numerous ramifications when one is compelled to observe humans in the knowledge that rational and cultural acts are absolutely suffused by emotional punctuations and that competing observations sometimes work towards one final version. This should be more expected than it customarily is. If human semiosis is the oscillation between mind-dependent and mind-independent being, then the emotional motivation and interest played out between the two is bound to render observership problematic. If one is observing other species in which the motivations and interests in their significations are by no means clear, then the task is difficult in a related, but distinct, way – not because one must give up the aim of ever knowing anything that is not superficial about the species but because one must acknowledge, as here in the example of human motivation, the overdetermination of observership.

Observation across species

There is a direct counter-point to the theoretical modesty that is entailed in restraining oneself in one-to-one observation that also illustrates the need to understand overdetermination and to conceive of a *field* of semiosis. The 'knowing' of species which contemporary semiotics aims to analyse, does not occur in a vacuum. Famously, in the case of Clever Hans (Sebeok and Rosenthal 1981), there is the problem of anthropomorphism and the pathetic fallacy: the role of the human observer, the wishful thinking of the audience for Hans' 'spectacles', the projection onto him of human capability, was instrumental in the horse being deemed 'Clever'. This is the lesson, too, of those research projects which were premised on the possibility of a language faculty in primates or other animals (Sebeok and Umiker-Sebeok 1981). Yet, the eschewal of anthropomorphism in observation of species has a behaviourist residue by which conclusions about interests, motivations, relations, purpose and 'knowing' were outlawed. The apotheosis of such non-anthropomorphism is to be seen in research which is organized around quasi-objectivity and reaching conclusions on the 'undecidability' of phenomena – research which is overly cautious about observership.

Excessive caution and habitual resort to the category of 'undecideability' has come to haunt some perspectives in the humanities. An example is that of posthumanism. The zoologist Hediger (1981: 5), implicitly undermining the tendency to undecideability, suggested, in consonance with Wheeler, that the pressing issue is observership and the acceptance that fields of observership involve modification:

> maybe it is a general law that through observation the observed will be altered (…) This means that in an animal experiment we have to work not with pure unaltered animal behavior, but always with the behavior of the animal plus the influence of the human observer.

For Hediger, the animal – in this case, Clever Hans – cannot be considered as just 'an animal', outside the observation process, but only as 'an animal in interaction with a human' – just as Kinski or Herzog is 'a human in interactions with another human and a movie camera'.

Beyond inter-species communication, to intra-specific communication of non-human animals, there remains the problem of observership, delineated by Thure von Uexküll (1983: 3), by which humans can only grasp zoo- or phytosemiosis with anthroposemiotic concepts. Yet, that problem can be approached, according to von Uexküll, through acknowledging the openness of living systems whose homeostasis is effected by open exchange with their environment. A sign therefore signifies to the activity of a living system something which has significance for the maintenance of the homeostasis of that system. For example, as von Uexküll, (von Uexküll, T. 1983: 5) writes:

> The grasping and eating of a food object creates the conditions in the gastrointestinal tract for the activation of the phytosemiotic sign processes which signify to the intestinal cells that they must absorb needed substances. The object

> ‘food’ contains carbohydrates, fats, and proteins – the signified ‘something’ for these phytosemiotic signs.

The process in question, then, is mutually transformative rather than a case of sign and object. Observing such mutuality is not simple. Although plants do not have specialized receptors, observers of animals have to concentrate on the way the environment influences the receptors of living systems (e.g. when light strikes the retina), taking into account that living beings are not always aware of these alterations in structure. Every subject can only perceive the activity of its own receptors, never that of the receptors of other subjects.

More recently, focusing on processes of mimicry across species, Timo Maran has highlighted precisely these key issues of observership. He notes (2017: 49) that the scientistic viewpoint prescribes a “ fact-based, neutral” approach “independent from human psychology and biological makeup or cultural context” and that it is “the mistaking of the mimic for the model by humans that often initiates forthcoming scientific research”. A common example of this in research on species has been the failure of researchers to recognize mimicry in the act of camouflage, taking the characteristics in a camouflage situation, as stable constituents of the species under observation. Maran thus calls for “a concurrent comparative analysis of the perceptual capacities of humans and receivers” to avoid “biased results due to the specifics of the human Umwelt and hidden anthropomorphism deriving from this” (2017: 50). There is a need to consider the way in which “the perceptual capacities of the human observer are positioned in relation to the mimic, the model and the receiver of the mimicry system”. Again, then, in this type of observation, there is a conception of observation in which the *signs* of the animals involved, human and non-human, no matter how different they may be, constitute the field in which the interaction takes place. Acknowledging this – that genetics does not precede the field of semiosis, “that qualitative perception and interpretation are not just epiphenomena of the underlying genetic processes, but have an essential importance for organisms to interact with their environment” (Maran 2017: 50) – is the first step towards adopting the biosemiotic perspective.

In terms of their bearing on the issue of observership, Maran’s assessments are particularly astute. He focuses not so much on the over-construing of mimicry by human observers witnessed in the typical cases of anthropomorphism identified by behaviourists. Instead, he draws attention to what different animals, with their own Umwelt, miss – for example, the mimicry system between red helleborine *Cephalanthera rubra* and bellflowers *Campanula* (the difference in colour of which is evident to the human but not the bee) or the fin of the male *Haplochromis burtoni* which is an example of mimicry for the female of the species but is difficult for the human to identify as such (2017: 51, 52). Maran (2017: 53) suggests that in cases where the description of mimicry systems that are perceptually inaccessible to humans, elaborate conceptual tools and theoretical models could be helpful in compensating for the Umwelt difference. Of course, the option to resort to nuanced descriptions and elaborate models is a feature of the human observer which distinguishes the species from other living systems. As

the ‘semiotic animal’, the human is uniquely placed among living beings by virtue of its ability to recognize and describe sign functioning, a point with which both Deely (2010) and Thure von Uexküll (1983) agree. As the latter states (1983: 7), “Only man can add to what he sees, hears, feels, and smells something that he knows”. Still, in inter-species observation there is a need not only for good description by the human of animal signs, but also the fullest possible understanding of the *context* of the semiosis, the behaviour of the animal. This will reveal (von Uexküll, T. 1983: 9),

> [T]he contrapuntal relationship (J. v. Uexküll) between the performance of its effectors and the matching counter-performance of the objects. Thus the mouth of animals conforms to its food, the wing of birds to the air, and the fin of fishes to the water

Effectively, ‘good’ observation has to proceed from acute knowledge of the environment of the observed animal. Equally important, though, as both Thure von Uexküll and Timo Maran make clear, is that the human observer especially has to know its own sign processes, the Umwelt from which the observer’s sign’s emanate and circulate. In the terms used hitherto in this discussion, what is called for is an apprehension of a *field* rather than just an object.

Gary Shank (2010) has proposed a speculative practice, based upon the same principle, for learning. ‘Exopedagogy’, he suggests, can shed light on ‘knowing’ and the alteration that is the result of observation. Ultimately, exopedagogy would involve learning the boundaries of human knowledge and the limits of human observership from mutual teaching projects with extra-terrestrials; but, in the absence of extra-terrestrials, it might involve terrestrial inter-species interactions in which species-specific observership, as well as a testing of *Umwelt* overlaps, might be conducted through, for example: learning to inform, learning to warn (in fact, a subset of informing) and learning to deceive. Deception , as Shank points out, is crucial since it involves a mimetic signification, the purpose of the mimicry being to deceive other species but also, in its effectivity, demonstrating species overlap at the level of the iconic sign – that is, signs which signify according to qualities, recognized by observers or sign users, between a sign and its object. Of course, such mimetic overlap and deception characterises inter-cultural communication such as that involving the decoding of individual serenity as madness (see the Kinski-Herzog example, above).

Again, the point to be emphasized is that the observer’s semiosis and that of the observed animal make up a general field of semiosis in which the interaction takes place. An additional point here, perhaps, is that the imperative for the observer to know the full reach of their semiosic capacities is not a scientistic issue. Despite attempts to separate the humanities from ‘the sciences’, putatively owing to their concern with a different class of objects, proper scientific observation cannot deny the status of the objects of humanities as part of the human Umwelt (cf. Cobley 2014). Fixation on science as the only true means of ‘knowing’ the world entails a belief in the primacy of scientific method and a banishing of all that cannot be evaluated in that method. Predictably, that includes many of the phenomena that dominate first-person experience and cognition - ‘feelings’, for example.

Mechanist or physicalist models of science, in particular, are prone to consider only those acts of observation that register quantitative difference as legitimate forms of 'knowing'. By contrast, a number of alternative perspectives on knowing have emerged in recent years, suggesting that the evacuation of meaning and experience offered by the information science paradigm is no longer tenable. The most persuasive of these, as iterated earlier, is the productive fusion of philosophy of science, second-order cybernetics and systems theory, biosemiotics, Peirce's philosophy, phenomenology and embodied cognition that makes up cybersemiotics (Brier 2008). The critique of traditional models of 'knowledge' in cybersemiotics, coupled with its proposals for a transdisciplinary vision, compels readers to view life, consciousness and cultural meaning as constituted by the continuities of nature and evolution (see Cobley 2010). Its insistence on embodied first-person consciousness, proceeding from meaningful experiences rather than positing an exclusive subject and object as the basis for knowledge, demonstrates that a comprehensive theory of observation, has to embrace the humanities and the arts (Brier 2008: 141). Otherwise, it will not avoid the stalemate of the sign-object, observer-observed dichotomy in which the hyphen constitutes Wheeler's thick glass slab, occluding the participants' engagement in a field. Such a realization as informs cybersemiotics also underpins commitment to the diversity of forms of 'knowing' beyond scientistic materialism. It is a commitment that renders some dominant models of scientistic observation naïve.

Thure von Uexküll targets precisely such naivety when he notes that observation is a matter that directly impinges on the belief that "perception is merely a passive process". So, "Many scientists hold to this false belief, thinking that they can passively obtain a true picture of the real world if they only avoid any subjectivity" (von Uexküll, T. 1983: 10). He adds (1983: 10),

> We can call this form of observation which excludes an account of the role of the observer 'naïve' observation. By contrast, we can speak of 'participant' observation in which the observer takes the role of the observed subject and shares its sign processes . . .

For the 'naïve' observer, observation is unproblematic: it is the capture of a passive world in which the differences of apprehension among that world's inhabitants is of no scientific consequence. Put another way, the 'naïve' observer keeps nature at arm's length and refuses to acknowledge its variegated contexts. 'Naïve' observation, as second order cybernetics has been at pains to stress, does not incorporate the processes of 'knowing' in the observed into the considerations of the observer.

Cybersemiotics and biosemiotics: *Σ*-sciences

Growing partly out of ethology and the possibility of inter-species communication that Shank's exopedagogy proposes to utilise in learning, cybersemiotics insists on the awareness of the observer in the theory of science. In particular, this implicates first-person experience which, as Brier (2008, 2010) demonstrates so forcefully, is sadly missing from so many areas of Western thought. As such,

cybersemiotics seems to characterize what might be called a 'science of knowing'. The term comes from a paper by Kull (2009) in which he identifies "*Φ*-sciences" characterized by universal laws and quantitative methods and "*Σ*-sciences" concerned with local semioses and using qualitative research to investigate its 'objects'. In the latter, the point is to take into account the 'knowing' of both the organism and its environment; this is thoroughly embraced and explored while recognizing that humans cannot 'know' *on behalf* of the organism but can only produce a copy (usually verbal in scientific research, but possibly nonverbal in other forms of presentation such as the arts). Thus, in the science of 'knowing' called biosemiotics the theory of *Umwelt* is central – as such, it is remembered that the object is never neutral for any species. The *Umwelt* of an animal, for example, is its 'objective' world – not 'subjective' as is so often assumed – since all 'objects' (as opposed to 'things') are dosed with experience. As Deely (1994: 11) shows, this conception of the animal's 'objective' world compels us to be precise with regard to the way in which 'objects' contrast with 'things' and 'signs':

> There are signs and there are other things besides: things which are unknown to us at the moment and perhaps for all our individual life; things which existed before us and other things which will exist after us; things which exist only as a result of our social interactions, like governments and flags; and things which exist within our round of interactions — like daytime and night — but without being produced exactly by those interactions, or at least not inasmuch as they are 'ours', i.e. springing from us in some primary sense.

Objects for animals will be, at the least, '+' or '-' or '0' – worth seeking out, to be avoided, or safely to be ignored, respectively. These basic object categories are obviously much extended and nuanced by human animals with their specific embodied cognition and with their extensive range of first-person experiences. Yet, in acts of 'scientistic' observation, with their commitment to neutrality, such experiences are bracketed in order to produce an object devoid of customary emotional, psychological, spiritual and generally personal investments.

Thus, for Thure von Uexküll (1983: 11), the neutral or '0' object requires qualification. In a scenario where a human throws a stone to ward off an aggressive dog,

> The stone lies in the objective observer's hand as a neutral object; but it is transformed into a meaning-carrier as soon as it enters into a relationship with a subject. Because no [non-human] animal ever plays the role of an observer, one may assert that it never enters into a relations with a neutral object. Through every relationship, the neutral object is transformed into a meaning carrier, the meaning of which is imprinted upon it by a subject.

Strictly, the neutral '0' object does not exist for non-human animals; it is always in a relationship according to how it impinges on the animal. Where a neutral object in human terms has a kind of constancy for humans, non-human animals can only experience inconstant objects which, regardless of the fact that they are a

constant for humans whether lying on a path or being thrown, have characters determined by their meaning relevance for that animal.

The concept of the neutral object is clearly very much the product of human observership. It exemplifies what Deely, Poinsot and Aquinas identify as integral to human understanding: the ability to conceive mind-independent being, to realize that there are signs of something and that there are 'things' about which we can only have knowledge through signs. As Thure von Uexküll (1983: 12) states, neutral objects keep their constancy even if they disappear from the horizon and this leads to the belief that neutral objects exist independently of signs and sign systems. This also encourages the neglect of signs as "magic formulas whose creative power changes our world and ourselves" (1983: 12). Naïve observership, of course, misses the magic - the field of semiosis. A participant observership, on the other hand, will result when – counter-intuitively, according to traditional conceptions of scientific observation – the observer becomes "emotionally involved" (1983: 13) with objects that entail danger, hope or despair.

Observership which is based on this understanding of objects – as "what the things become once experienced" (Deely 1994: 12) – is indigenous to contemporary semiotics. It is an exemplar of pragmaticist 'realism' in opposition to "metaphysical [or naive] realism" (cf. Glasersfeld 1991) predicated on a one-to-one relation of thing and sign. It underwrites the possibility of arriving at *one* world out of *many* observer-participants. Indeed, it is the placing of too much faith in the possibility of avoiding anthropomorphism which seems to be close to naive realism; blunt, 'objectivistic' accounts of the world as 'undecideable', in their very retreat from 'naïve realism', fall into the arms of Kantianism and the belief in an unknowable 'ding an sich'. In semiotics, perhaps there is a need to acknowledge, along with Shank, that anthropomorphism can linger, or even be a beneficial part of scientific work. In so doing, what is observed is not 'the natural world' as a unified entity, but all the conflict that constitutes the natural world (e.g. between humans and other organisms), the motivation and interest that occurs in the natural world and the *relations* which obtain in signification between and within organisms. What is observed is a world which alters with each human observation, no matter how much the humanness is taken out of the equation. If no world can be conceived beyond that of neutral objects – stable, immutable and wholly independent entities - then not only are 'the sciences' rendered impotent, but so too do the arts and humanities become pursuits that are justifiable only in terms of their intrinsic qualities rather than by their relationships with subjects (cf. Cobley 2014).

Following Peirce, the future entails the observer in semiotics getting as close as makes no difference to the 'thing' which is beyond the sign and the object, and which is at the boundary of the *Umwelt*: that is, 'science as knowing'. This contention of Peirce regarding observership dates back at least to his essay 'Some consequences of four incapacities', a wholesale refutation of Cartesianism published in 1868. "[It]t follows", writes Peirce (1868: 148), "from our own existence (which is proved by the occurrence of ignorance and error) that everything that is present to us is a phenomenal manifestation of ourselves".

Although not using the term 'observership', Peirce nevertheless invokes the metaphor of the rainbow to demonstrate that there can be a "phenomenon of something without us", a mind-independent being. The rainbow is a manifestation of both rain and sun; yet, in requiring both in order to be manifest, it is analogous to "we ourselves" at the moment of observership of some thing "appear as a sign". The way in which observers are caught up in a *field* of semiosis is most eloquently expressed in an essay on 'Some consequences' by Fernando Andacht which refers to a potential "Möbius-like diagram of Peirce's account of the process of knowledge". He adss: "there is no clean/cut division of outside/inside, only the flowing action of signs on both sides" (Andacht 2014: 17). Comparing Peirce's contention with that of solipsism, exemplified by William James for the purposes of the essay, Andacht convincingly demonstrates Peirce's "epistemological hope" (2014: 19) that observership, guided by the right conditions, can bring us closer to what constitutes reality. Those conditions must surely involve non-naïve apprehensions of what is mind-independent and what is mind-dependent. The human use of 'signs', as has been seen, is characterized by partaking of both mind-independent and mind-dependent being, partaking of the quintessential personal experience that makes up 'objects' while also taking account of the 'neutrality' that enables humans to conceive of a world that is, at once, beyond their experience but, at the same time, not necessarily unassimilable to their senses. It is on these grounds that the proposal for Σ-science, which benefits from a distinctive understanding of observership, proceeds. Contemporary semiotics generally embodies such a paradigm, but both cybersemiotics and biosemiotics, in their commitment to 'knowing' across the entire field of semiosis, will be at the forefront of this impetus.

The world as it will be: Thirdness and affordance

There is one additional feature of semiotic analysis and research that should be mentioned in relation to observership. It concerns projection, the future and what Peirce – a scientist engaged in predictive work (cf. CP1.26) for most of his career at the US Coast and Geodetic Survey – called 'Thirdness'. Much research, including anthropology in the sphere of the human sciences, has prided itself on reporting the 'world as it is'. Some contributors to (political) philosophy have attempted to promote *changing* the world; but, by and large, research has remained committed to explicating and presenting 'fact' about the world at the moment that the research took place. In the physics that Wheeler pursues, present 'fact' amounts to a very small part of his object of study. He writes (Wheeler with Ford, 1998: 232)

> Moreover, it was my philosophical conviction that nature would avail itself of all the opportunities offered by the equations of valid theories. If nuclei *could* exist in doughnut shapes, I felt, then some of them *would* exist in such shapes. If heavy matter *could* be made from electrons and positrons only, then some heavy matter *would be made of these particles. If matter* could collapse to infinitesimal or even zero size, then matter

> *would* collapse. We physicists should think about where such extreme behaviour might occur, and look for it.

Again, Wheeler states a tenet of semiotics: that what 'is' or 'has been' should also be accompanied by considerations about what 'could be'. This is another way of posing the importance of Thirdness in semiosis, the moderating and mediating factor (CP1.337, 366, 533, 2.89, 3.423. 5.104) that entails observership will be orientated to considerations of the future (CP1.343, 5.292). Observership is such that 'fact' will remain in doubt, no matter how strongly it is proclaimed, because it will be yesterday's 'fact' measured with yesterday's device in an altering situation of observer and observed. In a study of, for example, media uses of a specific media technology, then, what matters in observership is not so much what people are reported to be doing with that technology at the moment (although that is not insignificant). Rather, what is important is a fuller picture of the potential of that technology for its users, an account of what James Gibson (1986) has called "affordances". These affordances are all the opportunities in the environment which support particular kinds of functioning by particular animals with the sensory apparatus they possess. (Gibson [1986: 138] traces the origin of the concept to gestalt psychology but it seems to derive from Jakob von Uexküll's [1980] work). Observation of such a technology and its uses therefore needs to embrace the *potential* uses of that technology rather than risk the sterility of an account of its reported uses in an observation process which not only misses potentiality but attempts to thicken ethnographic accounts through positing a one-to-one relation to 'culture' (see Cobley and Haeffner 2009).

The human sciences' enslavement to 'fact' has meant that they are in perpetual pursuit of 'context'. This is evident not just in the aspiration to 'thick description' but in anthropological 'classics' such as Malinowski's (1923) essay on phatic union which call for rich contextual knowledge. This pursuit is not a problem in itself; after all, the notion of sign as a triadic relation is an exemplar of sign-in/as-context. Yet, the context in question in semiotics is not simply rooted in the precise situation of semiosis. What is important is that observership is attuned to the *potential* engendered by the sign's movement back and forth between mind-dependent and mind-independent being. In a strongly Augustinian analysis, Brooke Williams (1983: 14-15) notes that the typical ways of viewing history as a relation between past and present often forget the tacit premise "that time exists as the finite human mind structures it, insofar as the historian's object is past human experience". A star's existence in past solar time, therefore, does not preclude its existence in the present for some observers who receive its light ages later. In this instance, "solar time" is synonymous with a mind-independent reality – facts, neutral objects - when, in truth, the nature of the star and the retina of the eye is such as to make a field of light where, to a great extent, mind-dependent reality obtains.

Conclusion

Semiotic research does not abrogate its responsibility to 'fact' in the general sense of what is 'true' and what has effectivity. Yet, with its theory of the sign, semiotics leads observership further: to a view of *what could be - vis a prospecto* causation. Cariani (1998: 4) states that a properly evolutionary semiotics "asks how a 'sign' becomes a 'symbol, i.e. how new semiotic relations come into being ('semiogenesis'). This involves both how existing relations are adaptively altered by experience ('learning'), and how new sign-distinctions themselves might arise de novo ('functional emergence')". This focus on new semiotic relations is also the basis on which semiotics can sustain itself institutionally. Traditional disciplines, with only a slightly more established place in the academy than semiotics, have implemented their institutional support to maintain confidence in their continued efforts catalyzing change and the growth of knowledge in the world. In fact, it is semiotics' observership which truly effects change and greater knowing. Through its operation in a *field* where observership affects the object itself, semiotics has been a demonstrable catalyst for change. That has been witnessed in the last fifty years when semiotics transformed the landscape of the humanities and social sciences by calling in from the cold all the objects of observership which had hitherto been considered off radar to other disciplines. Without semiotics, it is unlikely that either popular culture or creative practice would have receiving anything approaching the attention that is now bestowed upon them by the global academy. Semioticians will – and must - continue to find new objects of observership and, in the process, change the future of knowing.

As Williams (1983: 18) points out, the kind of observership in which Sebeok was embroiled when enlisted to ponder the problem of transmitting a sign to warn humankind ten thousand years from now of buried nuclear waste, exemplifies the future-orientation of semiotics:

> Even if the feat could be achieved in the mind-independent order of physical being – that is, even if the sign could survive physically – its signification would be constantly changing because of the mind-dependent contents forming part of the act of observation in the course of time.

The field of semiosis is always in flux and the human observer (also a sign, as Peirce would have it), is likewise in flux. The semiotic observer's alignment with that of the quantum observer arises from acts of observership on both sides of the exchange taking place not through a glass darkly but through a mutable field of interaction. In quantum and semiotic perspectives, observer and observed are not sustained as two mind-independent entities but, in the former, are implicated in a field of energy modification, and in the latter, are enmeshed in the field of semiosis, with the human participant oscillating between mind-independent and mind-dependent being. Hopefully, the point about mutual fields is clarified and not over-simplified in the following table:

	Observes
Newtonian	material points in time and space
Relativity	phenomena relative to time

Quantum	in a modifying field
Semiotic	in semiosis

Observership involving only neutral objects constitutes an unrealistic expectation, both in the observation of human and non-human realms, although it may be possible in a limited fashion in respect of some machine observation of machines. Observing in a *field* of semiosis, with a participant observation in Thure von Uexküll's terms, and with respect to the potential *vis a prospecto* causation, entails not just an observership derived from rational reconstruction of pre-determined concepts of 'culture' and situation, but research which goes beyond rationality to consider possible emotions, motivations, interests, aspiration, affordances and potentials. It requires an acute sensitivity to sign usage, sign transformativity and potential, sign relations, modelling, first person experience of signs and the status of the sign at the moment of observation. It also calls for semioticians to keep their nerve in the face of 'fact' and that particular rationality which seems to rule that a "barrel of eels" could ever be seen or that a "barrel of concrete" (Wheeler with Ford, 1998: 330) was not the product of observership.

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Heartfelt thanks, for indispensable advice, go to the editor of *Cybernetics and Human Knowing*, Søren Brier; the Peirce scholar, Fernando Andacht; and the two referees of this article.